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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/021,079 | 12/19/2001 | Takeshi Hoshida | 1460.1033 | 8722 |

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| EXAMINER | |
|---|---|
| TRAN, DZUNG D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2633 | |

DATE MAILED: 12/31/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/021,079 | HOSHIDA ET AL. | |
| | Examiner | Art Unit | |
| | Dzung D Tran | 2633 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *19 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Specification*

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 12-16, 20, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akasaka et al. US patent no. 6,501,593

Regarding claims 1, 20 and 23, Akasaka discloses an optical communication system comprising:

an optical transmission line for transmitting an optical signal sent from said transmitting station (figure 3, element SIGNAL);

a repeater station provided at one point or more in said optical transmission line (figures 8-11, col. 6, lines 35-54, col. 17, line 5-67); and

pump light sources (figure 3, elements 1) provided in at least two of said transmitting station, said receiving station, and said repeater station, for supplying pump light to said optical transmission line, wherein said pump light has two types or more of wavelengths (col. 14, lines 55-64). Although, Akasaka does not specific disclose a transmitting station and a receiving station. However, it is well known in the art that an optical system always have a

transmitting station for transmitting an optical signal and a receiving station for receiving said optical signal. Therefore, if it is not inherent, it would have been obvious that the system of Akasaka must have a transmitting station and a receiving station for transmitting the signal over the transmission line and receiving optical signal outputted from said optical transmission line.

Regarding claims 2 and 3, Akasaka further discloses optical transmission line has a Raman gain as a function of wavelength in which an interval between a minimum value and a maximum value of a wavelength of said pump light coincides with a width of an amplifying wavelength band
when a maximum value first appeared after a Raman gain generated by pump light starts showing coincides with a center wavelength of the amplifying wavelength band to be amplified (figures 12, 58, col. 25, lines 24-57), wherein: pump light has a first wavelength and a second wavelength; and second wavelength is set so that a maximum value first appeared after a second Raman gain generated by said pump light with said second wavelength starts showing substantially coincides with a local minimum value first appeared after a first Raman gain generated by pump light with said first wavelength starts showing, on said first wavelength (col. 22, line 50 to col. 23, line 33).

Regarding claims 4 and 15, shielding the pump light is well known in the art, one of ordinary skill in the art would have been motivated to do this in order to prevent the signal light leakage and provide a stronger light signal. Furthermore, whether or not to shield the pump light is merely an engineering design choice.

Regarding claims 5, 12,16 and 22, Akasaka further discloses residual light detecting means (element 4) for detecting optical power of residual pump light of said pump light (figures 28-36) and adjusting means for adjusting optical power of said pump light so that a detection result from said residual light detecting means falls within a predetermined fixed range; and detection result transmitting means for transmitting said detection result from said residual light detecting means to said adjusting means (element 4, col. 6, lines 10-19).

Regarding claims 13 and 14, Akasaka further discloses the pump lights has wavelengths of 1440 nm, 1450 nm, 1485 nm and plurality of wavelength band is C band and L band (col. 18, line 56 to col. 20, line 15).

3. Claims 6-11, 17-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akasaka et al. US patent no. 6,501,593 in view of Wu US patent no. 6,423,963.

Regarding claims 6-11, 17-19 and 21, as per claims above, Akasaka discloses all the limitations except for stopping means for stopping supply of the pump light. However, Akasaka disclose a control mean for monitoring input light or output light with respect to the Raman amplifier and for controlling pump powers of the pumping mean 1 on the basic of a monitored result to maintain output light power of the Raman amplifier to a predetermined value. Wu discloses a method for shutting off pump radiation from the Raman pump to the fiber (col. 3, lines 13-16). Therefore, it would have been obvious to an artisan at the time of the invention was made to include the teaching of Wu in the system of

Akasaka. One of ordinary skill in the art would have been motivated to do this since the controller of Wu do the same function as the claimed stopping means that is power-down the pump for reducing power consumption and for safety mechanism of Raman pump source. Furthermore, it prolongs the life of the pump.

**Conclusion**

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Nielsen et al. U.S. patent no. 6,445,492. Reduction of four wave mixing in Raman amplifier optical transmission system

b. Grubb et al. U.S. patent no. 6,344,922. Optical signal varying devices

c. Grant et al. US patent no. 6,611,368. TDM pump wavelengths resulting in ultra broad band, flat, backward pumped Raman gain

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung Tran whose telephone number is (703) 305-0932.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

Supervisor, Jason Chan, can be reached on (703) 305-4729.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600